

Scotland's Rural College

Food security in rural Uganda: assessing latent effects of microfinance on pre-participation

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Introduction

Microfinance organizations have been an integral part of international development efforts in the Global South since its inception in the early 1980's (Yunus, 1998). Microfinance is often characterized by providing impoverished women micro loans (generally around \$20 U.S.) to start small businesses. Typically, MFOs provide small loans at little to no interest rate (Yunus, 2007). Microfinance has been shown to improve social and economic situations for poor women in underdeveloped areas (Kabeer, 2005): specifically, improvements to health and food security have been reported (Morduch & Haley, 2002). In addition, improvements to women's empowerment, access to social capital, and participation in collective activities has been well documented in the literature. Since the 1980's MFOs have been on the rise in developing regions with estimates exceeding 7,000 different organizations; likewise, literature and research on MFOs has followed suit, with an extensive interest coming from governmental agencies, the World Bank, and research academics (Robinson, 2001). The positive outcomes of MFOs over the past decades have raised concerns that development researchers and practitioners have developed tunnel vision when it comes to the success of MFOs. In a widely cited paper in the journal *World Development*, Morduch (2000) warned of the onset of win-win attitude towards MFOs, which promised to alleviate poverty, “. . . at no cost to governments and donors – or perhaps even at a small profit.” (p.617)

Microfinance is not without its outright critics, most notable of which is Milford Bateman (2010), who stated, “. . . virtually *all* [emphasis in original] of the core assumptions that underpin microfinance today should more accurately be described as myths.” (p. 29) Bateman argues that, from a structural viewpoint, MFOs often fail in their original tasks, creating sustainable small business ventures, due to their foundation in neoliberal economics. Economic

neoliberalism is based on the idea of using individual incentives to spark development or another desired trait (Friedman, 2009).

There is, however, a lack of rigorous assessment of an MFO from its inception, and an understanding of how components of MFOs affect women who do not participate in MFOs. Because MFOs are usually coupled with other development programs or perhaps are initiated in the wake of previous development attempts, it is difficult to directly measure their impact (Morduch, 1998, 1999). Subsequently some researchers have instituted an experimental design in order make comparisons of participants in MFOs to a ‘control’ group; again, this is problematic due to outside development issues on control groups, which cannot be accounted for (Sarma et al., 2002). Therefore, this paper serves to fill a void in the literature by examining how the major influencing variables in MFOs predict the desired outcome; we argue that many MFOs strive to increase food security and access to additional income, overtime. This study is the first phase of a longitudinal study of a microfinance organization, which is sponsored by the U.S. NGO *Vessels International*; we intend to understand how the known influential factors of MFOs predict food security before the MFO initiative, in its pilot form, has been implemented. As we are ultimately interested in how MFOs positively influence participants, we must first secure a base model from which to make future comparisons. This approach may lend validity and reliability to historical study of MFOs, which have hitherto focused primarily on summative evaluation, or evaluating programs only after they have already been implemented (Khalily, 2004). A base model permits the use of a quasi-experimental methodology, by using the base model as a quasi-control group on which to make comparisons. Furthermore, this baseline study allows for a rigorous insight into how the variables often associated with MFOs influence food security within the study regions before participants start the program and how they change

throughout the duration of the program. In addition, the same variables of influence on food security will be also be tested on access to additional income; this analysis will allow for a better understanding of the linkage between food security and access to additional income.

This paper uses data obtained from a non-probability convenience sample of Ugandan women from two rural communities (n=129, for structural regression analysis): Bulike and Kaliro in Central Region, Uganda. A structural equation model (SEM) is used to evaluate the influence of factors on additional income and food security. Studies on MFO in the region have found that MFO's can increase women's social utility while having small to negligible returns on their financial situation (de Haan & Lakwo, 2010). Specifically, we are interested in the effect that a woman's level of empowerment, social capital, collective action, and access to additional income influence individual and a family's food security *before participating* in a MFO; in addition, we seek to understand how empowerment, social capital, and collective action affect ones access to additional income.

Literature Review

Social Capital

Perhaps the most influential definition of social capital comes from Putnam's (2001) work on the decline of civic engagement during the 20th century. Putnam found that high levels of civic engagement were associated with more participation in democracy, better economic viability, and improved satisfaction of life. In keeping with Putnam's (2001) and Coleman's (1988) work on social capital, the following definition shall be used to describe social capital in this paper:

Social capital is the reciprocity of cultural norms and values that allow for a system of trust to develop amongst rural villagers; this level of trust shall be so much as to aid in the viability of life and wherewithal to sustain villagers in time of disaster, drought, or any other impediment of life.

In this sense, social capital plays a uniquely pivotal role in the survival of African villagers who may have to depend on others for shelter, medicine, and sustenance for themselves and their families. Social capital has been linked to improved communal conditions for impoverished communities (Woolcock, & Narayan, 2000) and is often a critical component of many MFOs' social agenda. MFOs following the Grameen model generally call for and provide social and economic training to female participants; these training meetings provide recipients of microloans much-needed information and act as a locus of social capital formulation (Servon, 1998) as well as collective action. Microfinance programs – especially ones that provide group training – have positively influenced social capital in women (Holvoet, 2005).

Granovetter's (1973) classical study of the benefits of weak ties associated with bridging social capital, or networks that would not be considered primary relationships, revealed the importance of creating secondary network groups. O'Brien et al. (2005) took this concept further in suggesting that strong village ties might hinder outside network growth in his work on rural Russian communities following the collapse of the Soviet Union. In theory, microfinance organizations mitigate any obstruction of large social networks by linking groups of MFO

participants together, in the context of assessment meetings and other participant gatherings. By studying the influence that social capital has on additional income and food security of women who have been chosen to participate in an MFO, we will better understand how MFOs affect social capital over time – allowing for a better understanding of how social capital levels change over time in MFO's. We, therefore, hypothesize that social capital has a positive influence on a women's food security and her access to additional income.

Empowerment/Self efficacy

Empowerment and positive self-efficacy suggests that a woman believes she has power and control over her life, in so much as she is able to change her situation in the event of a large-scale catastrophe (Gaiha & Nandhi 2005). Much of the published discourse of women and empowerment in the 1980's and early 1990's focused on women as second-class citizens, who participated in capital market places only through the guise of their husband (Scott, 1995). Microfinance organizations, however, seek to empower women by placing them directly into a financial marketplace. Kabeer (2005) studies women's empowerment in developing worlds and posits three critical components to achieving true empowerment: 'The realization that one can create change in relation to social structures through the use of agency; 'having adequate resource to take action through agency; and, 'the achievement of their action through agency. Empirical research has shown that women who participate in MFOs have higher levels of perceived empowerment and self-efficacy than women who do not participate (Swain & Wallentin, 2009); and like social capital, women's empowerment is regarded as a mechanism for positive change in developing regions. Therefore, microfinance organizations often cite this as a component of the overarching program.

Nierenberg's (2002) study of gender myopia points out that women in rural Uganda's increased role in decision making is imperative in issues of better health, which are directly linked to the capacity of women to "control their own lives and destinies" (p. 9). Nierenberg continues to describe how the gender imbalance between men and women, as seen in Ugandan cultural attributes, negatively influences environment and economic issues—some of the major factors involved in determining food security (Molnar, 1999; Nierenberg, 2002). In rural sub-Saharan communities, MFOs are of central importance to women since they earn between 65% and 75% of males earnings for comparable work (Nierenberg, 2002).

Collective Action

Social scientists have long been interested in the mechanisms that influence people to act collectively in obtaining a group-goal. Mancur Olson (1965) first predicted that group size had the largest impact on successful collective action – specifically, those smaller groups were more likely to successfully act collectively. Subsequently, scientists speculated on the any group's ability to govern themselves when collectively using common-pool resources such as forests for gathering food and firewood, sources of water, and fish and game stocks (*see* Hardin 1968). Ostrom (1990) and Agrawal 's (2001; Agrawal & Ostrom, 2001) work on collective action and common-pool resources have a more optimistic viewpoint on collective action, especially collective action in groups in developing areas; citing that groups of people can successfully come together and self-manage their common-pool resources without outside coercion or influence. Collective action, or participating in community action groups, has been yet another positive social component of the microfinance movement. Sanyal (2009) observed

that female members of MFOs participated in several different collective action processes. These ranged from mobilizing villagers to aid victims of domestic abuse, to holding village men accountable to annul underage marriages. Often, collective action occurs as a result of other MFO attributes, such as the creation or development of social capital and empowerment (Anderson, Locker, & Nugent, 2002). Studies in agriculture regions suggest that collective action is an essential element to creating food sovereignty in developing rural regions (Meinzen-Dick, DiGregorio, & McCarthy, 2004). Though, it is not necessarily always incentivized by access to additional income (Meador et al., 2016).

Income

While they are the major contributors to basic needs of the family unit, females in Uganda are not only less involved in the decision making process, but many also lack access to inputs, land and sources of income (Tripp, 2002; Snyder, 2000). As indicated by Margret Snyder's 2001 study of women in African economies, though their participation in MFO opportunities is changing the present circumstances, female agriculturists and farmers in countries like Uganda within Sub-Saharan Africa produce 80% of food crops, but, are minimally involved in household and family decisions (Tripp, 2002; Arku & Arku, 2009; Mayoux, 2001).

Income as a predictor of food security in rural Uganda is an understandably palpable argument. It goes without saying that access to additional income in sub-Saharan Africa increases the likelihood that one is at least somewhat more secure in procuring a meal. According to a report issued by the World Bank (2013), subsistence farming in Uganda only accounts for about four percent of agriculture output, but it employs around sixteen times as

many people. While subsistence farming has been found to make a person more food secure, it does not outright ensure it (Baiphethi, & Jacobs, 2009). Unfortunately, whether or not a respondent had access to subsistence farming was not included in this study, so any effect it has on food security in the MFO context is unknown. The central theme of MFOs is that by providing low interest micro loans to the poorest of the poor, they will be able to create working businesses and generate income (Yunus, 2007). As previously mentioned, the early MFOs in Bangladesh focused their attention on generating some type of livable income; later, much notice was given to the residual effects of MFOs, like the generation of social capital and empowerment (Mosely & Rock, 2004). This study investigates the impact that each notable culturally positive latent effect of MFOs has on both accesses to additional income and food security.

Based on the aforementioned literature, we argue that MFOs have two primary goals associated with many existing programs across the globe, they are: access to additional income in the belief that it will ameliorate poverty and an increased sense of food security. We have also identified three vestige components of MFOs, they are: a greater sense of self-empowerment, increased social capital, and more participation in collective action activities. For the purposes of this study and future study, we identify these components of MFOs as *latent effects*. Moreover, a primary component of MFOs, which is building small businesses with the purpose of increasing income, will henceforth be described as the *manifest effect* of MFOs.

Methods

Bulike

Bulike is a rural community in Uganda's Central Region with approximately 30,000 residents, many of whom are seasonal male residents due to agricultural and other work opportunities outside of the

community. Of the community members which live in Bulike throughout the year, nearly 7,000 are women with a fairly homogenous level of education and social status. It is an agriculture-based community in which almost all residents exist in chronic poverty situations, regardless of income or standing within the community social structure. Most families live in mud brick huts roofed in grass or iron sheets without electricity and plumbing capabilities. The only shared community structures in this community are two churches and a primary school for the village's roughly 1,800 children, fifteen percent of whom are abandoned or orphaned and living with extended family or kinship relations.

Bulike is a community where nearly all female residents live on an income of less than one dollar a day, in food insecure situations. In an agrarian community like Bulike, achieving a food secure status is linked to protection of the natural resource base, and is an issue of vital importance since Africa has one of the most extreme rates of usable land degradation on the planet (IFPRI, 1996; Sanchez, et al., 1997). Additionally, the minimal income of Bulike's female population is significant because lack of income, a commonality among rural Ugandan women, generally indicates a food insecure situation, since food is usually available at a price, excluding unusual circumstances (Schultz, 1993; Timmer & Cabot, 1993; Molnar, 1999).

Like many rural communities in this region, Bulike is based on a patriarchal system where women have minimal opportunity for social advancement. This is especially relevant in food-insecure Bulike, where income is primarily related to agriculture since female agriculturists and farmers in countries like Uganda within Sub-Saharan Africa produce 80% of food crops, but, are minimally involved in household and family decisions (Tripp, 2002; Arku & Arku, 2009; Mayoux, 2001). The gender imbalance apparent in this community poses significant issues

related to poverty, and is the central focus of the microfinance program *Microvessels*, initiated by Vessels International, a Columbia, Missouri-based non-profit organization for which this research was conducted.

This microfinance program aims to address the inherent gender disparity and food security issues in Bulike by providing females with the opportunity to develop income-generating activities, which utilize community resources and support. Both the development of increased food security in Bulike, and protecting the ecology of usable agricultural land, are factors of decreasing rural poverty; but as Schrieber's study shows, income generation is equally as important in determining a rise from poverty situations (Cleaver & Schrieber, 1994; Sanchez, et al., 1997). Fortunately, this has already proven to work well as a design in the community, and was agreed upon as a suitable path forward by community members. More importantly, however, this project has garnered support from community and district leadership, both of which are anxious to see the project bring positive change in Bulike.

Kaliro

Kaliro is a semi-urban community in Kaliro district, Central Region, Uganda, with approximately 23,000 residents, nearly 12,000 of which are women, many of whom are single mothers. It is a community whose economy is based on both agriculture and small business in which more than half of the residents are living in chronic poverty situations. Many families live in mud brick huts roofed in grass or iron sheets without electricity and plumbing capabilities, while concrete-construction homes with both electric and plumbing connections remain

minimally available. There are various shared community structures including churches, primary and secondary schools, meeting halls and district offices.

Kaliro is a patriarchal community where nearly all female residents live on an income of less than one dollar a day and have minimal decision-making ability. This gender imbalance is important to this research since women are the major contributors to the family unit's household needs, yet lack access to inputs, land and sources of income—all of which are essential in agricultural capability to ensure food security. The gender disparity apparent in the social structure of Kaliro is important because, as Nierenberg points out, gender imbalance between men and women, as seen in Ugandan cultural attributes, negatively influences health, environment and economic issues; some of the major factors involved in determining food security (Molnar, 1999). Furthermore, Kaliro's female population is significant since their diminished role in decision-making is a component of health and environmental protection issues, both of which are directly linked to the capacities of women to “control their own lives and destinies” (Nierenberg, 2002, p. 9).

Like many communities in the district, the majority of residents live in food-insecure situations. Food security is defined as: “access for all to sufficient and nutritious food” according to the 1996 World Food Summit, and is vital to alleviating poverty; this is of critical importance to said project, since women are essential in securing food security (FAO, 1996; Sanchez, et al., 1997). The gender imbalance apparent in this community is directly related to the minimal food security of residents, and is the major issue addressed by the microfinance program *Microvessels*,

initiated by Vessels International, a Columbia, Missouri based nonprofit organization, for which this research was collected.

Microvessels aims to address both the food security and gender issues in Kaliro by providing females with the opportunity to develop income-generating activities, which utilize sustainable community resources. The 1996 World Food Summit addressed the link between food insecurity and poverty situations, which is significant to this research since they are characteristics of Kaliro and the areas of *Microvessels* efforts in poverty alleviation (FAO, 1996). Microloan programs are of central importance to females since they earn between 65% and 75% of male earnings for comparable work (Nierenberg, 2002; Harrison, 1984). *Microvessels* provides significant incentive and opportunity for females to reach a more level socioeconomic playing field in communities like Kaliro. As a result of community-supported program participation, females are able to more easily access the necessities for increasing agricultural output and household and resource management, both of which are essential to rural community development (Tripp, 2002; Snyder, 2000).

Data Collection & model development

Based on previous literature, we argue that women's empowerment, increase in social capital, and access to collective action are latent effects associated with participation in MFOs. In addition, the three latent effects of MFOs likely will have a positive influence on a women's food security in the absence of any formal MFO participation; likewise these three latent effects of MFOs will likely influence access to the manifest effect of MFOs, which is additional income.

The following null hypotheses are tested:

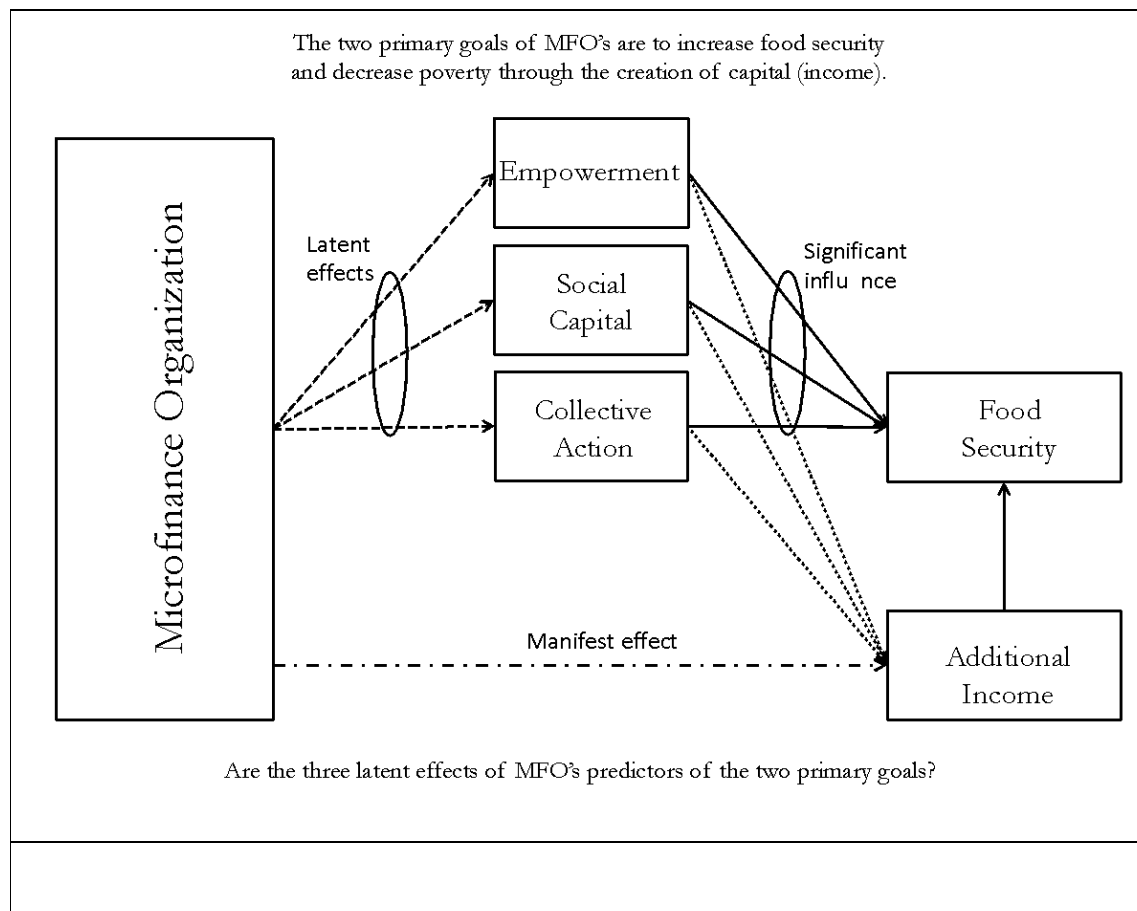
H₀₁: Food security is statistically influenced by the three latent effects of MFOs

H₀₂: Food security is statistically influenced by access to additional income.

H₀₃: Access to additional income (manifest effect) is statistically influenced by the latent effects of MFOs.

Figure 1 displays the theoretical model that is tested. The model illustrates that the three primary latent effects of MFOs (women's empowerment, access to social capital, and participation in collective action) have a positive influence on food security. The model also implies that we theorize the manifest effect of MFOs, access to additional income, will have a positive influence on food security. We test whether or not the latent effects will predict both the primary functions of MFOs: increasing food security and access to additional income.

Figure 1: Theoretical model of manifest and latent effects of MFOs



Survey data for this project (n=129) were collected from respondents identified as potential participants in the Vessels International *Microvessels* program. All subjects were females, identified as single or married individuals, living in high poverty situations within the municipalities of Bulike and Kaliro in Kaliro District, Central Region, Uganda. Potential interview respondents were chosen by community partner organizations located in each municipality. Participants were not chosen; rather, they were identified as possible MFO candidates based on their voluntary participation in initial scoping exercises by the not-for-profit who commissioned the project. All survey data were collected via in-person interviews conducted by a primary researcher and a local translator, on behalf of Vessels International. Focus groups comprised of community leaders and members was utilized in both Bulike and

Kaliro prior to the commencement of survey interviews to determine cultural appropriateness, and relevance to the study. The result of both focus groups was a unanimous decision in favor of keeping the survey unchanged since survey questions were chosen based on their use as past empirical measurements of social capital, trust, village involvement, and collective action, while addressing issues inherent in both study communities. Furthermore, a means comparison and ANOVA test showed there was no significant difference between ID's amongst the two villages; knowing this, the two villages were combined into a single analysis. The survey instrument was adapted from previous scholarship on surveying in international settings, specifically measuring social capital (*see* Grootaert 2004; Grootaert & Van Bastelaer, 2002). The survey questions used in this study were directly adapted from a working paper published by the World Bank's (2004) Integrated Questionnaire for the Measurement of Social Capital (SC-IQ); the SC-IQ is an attempt by academics and practitioners to develop a set of empirical tools that measure social capital and trust indicators in developing regions via household surveys. Similar studies have used the SC-IQ as a base set of social capital and trust indicators in South Africa (Pronyk, Harpham, Busza, Phetla, Morison, Hargreaves, Kim, Watts, & Porter, 2008), in Central America (Mitchell & Bossert, 2007), and in rural China (Wang, Schlesinger, Wang, & Hsiao, 2009).

Following the completion of the survey, data were entered in SPSS and AMOS for statistical analysis and modeling. First, descriptive results show univariant characteristics—the most important of which, perhaps, is the standard deviation of each variable. Second, a structural regression model tests the aforementioned hypothesis. AMOS has been utilized to illustrate a graphical representation of the model. The structural path model allows for the understanding of the effects of each variable on both additional income and food security (Kline, 2012).

The path model was created using a two-step process:

1. First, a general linear regression model was used to test the significance of each predictor variable on the dependent variable. Any ID not found to be significantly significant in predicting income was omitted from the path model.
2. Second, a structural path model was created to better understand how each predictor variable influences food security, as well as to infer any possible mediation effects.

The model provides the direct and partial indirect effects of each predictor variable on income and food security. The numbers associated with each path are standardized regression weights and the asterisks represent significant p values at $<.05$. Additionally, any path that passes through another predictor variable, i.e. empowerment, indicates a possible mediation effect is taking place. A mediation effect can be interpreted as intervening causal effect; generally, in the social sciences there may be several mediation effects on a given dependent variable (Baron & Kenny, 1986). Because of the low sample size of this study, mediated effects will not be statistically tested; although, mediated effects have been observed in studies with lower sample size, it is not recommended (Fritz & MacKinnon, 2007).

Results

Table 1 provides the descriptive statistics for variables included in the hypothesized model. The dependent variable or endogenous variable, food security, was measured using a single survey

question, “do feel that there will be some time in the near future that you and your family will be short of food?” This question was answered using a Likert scale ranging from 1 to 10, with 10 being very likely. The 1 to 10 point scale, rather than a more traditional 1 to 5, was chosen to allow for a more normally distributed dependent variable. The model’s other endogenous variable, access to additional income, was measured with the question, “Do you have access to additional income (income other than what you consider to be your primary or main income)?” This metric was answered dichotomously, with a simple “yes” or “no” as was the question measuring village participation (asked, “are there community activities in which you are not allowed to participate?”). The remaining independent variables measuring empowerment (asked, “do you feel you have control over decisions to change your life?”), collective action (asked, “how well do people in your village help each other?”) were asked using a 5 point Likert scale with 5 being the most positive choice.

Table 1: Descriptive Results				
			95% CI	
DV	Mean	Std. Dev.	Lower	Upper
How likely do you think there will be a time this year when you are short of food?	4.33	1.77	4.03	4.62
IV				
Control over decisions to change your life	4.03	0.49	3.95	4.11
How well do people in your village help each other?	1.81	0.69	1.68	1.93
Are there community activities in which you are not allowed to participate (1=yes)?	0.18	0.39	0.12	0.26

Access to additional sources of income	1.30	0.81	1.17	1.45
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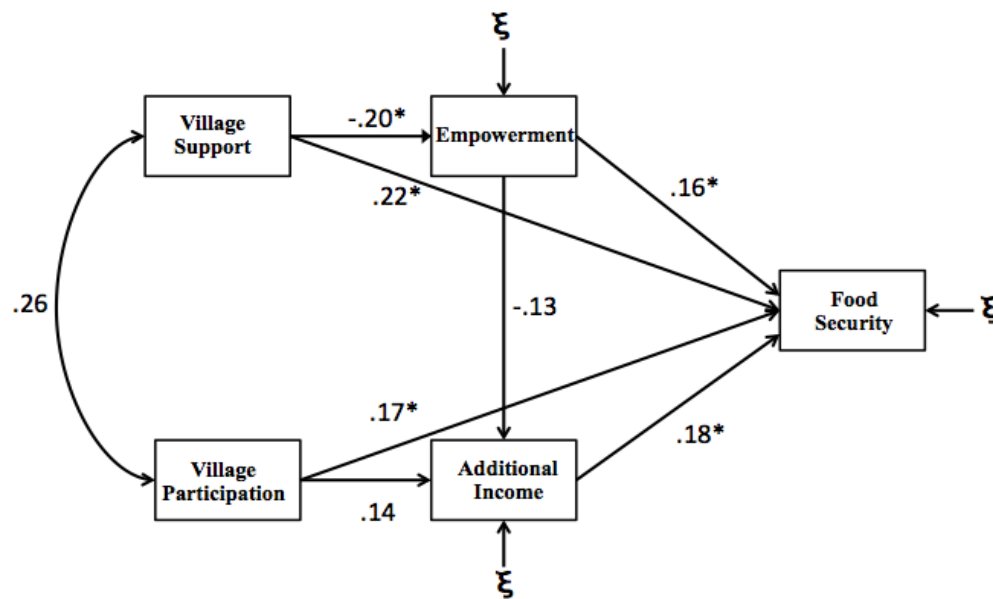
Table 2 illustrates the simple linear regression results. The purpose of testing a simple linear regression model prior to testing a structural path model is two-fold: first, it allows for a general understanding of how food security is influenced by each ID; second, it ensures that only statistically significant predictor variables are included the path model. Each ID variable in the model is statically significant at $\alpha.05$. The model explains only about 16% of the total variance, this is expected due to the low number of variables and the fact that a higher degree of measurement error is likely due to translation (Mitchell, 1965), etc.

Table 2: Linear regression results				
	B	Std. Error	Beta	Sig
Control over discussions to change your life	.897	.287	.258	.002**
How well do people in your village help each other?	.486	.212	.196	.023*
Are there community activities in which you are not allowed to participate, 1 coded 'yes'	-.781	.377	-.179	.040*
Access to additional sources of income, 1 coded 'yes'	.353	.176	.167	.047*
DV is food security, * $p < .05$, ** $p < .01$, *** $p < .001$, $R^2 = .158$				

Table 3 reports the model's associated fit indices. According to each fit index, the overall model fits the data quite well, given the low sample size. The results presented in Figure 2 illustrate the best path model of each ID on food security and empowerment and additional income as mediators of collective action and social capital. We use the term best path model due to the

two-stage process of using variables that were predictors of both additional income and food security. Table 2 describes the regression results for each predictor variable on food security. The path model is an aggregate of both simple linear models, using both income and food security as endogenous variables. The single-headed arrows in Figure 2 represent the standardized regression coefficients (Betas); asterisks represent a p-value of < .05; no beta coefficient had a p-value < .01 or less

Figure 2: Structural path model with standardized regression coefficients



Additional income is both an exogenous variable and endogenous;
food security is endogenous.

Table 3: Model fit indices

RMR ⁻	GFI ⁺⁺	AGFI ⁺⁺	RMSEA ⁺
.010	.999	.981	.000

+Closer to '0' indicates good model fit, ++Closer to '1' indicates good model fit

Interpreted according to Hooper, Coughlan, & Mullen. (2008)

Village support, as a measure of social capital, has the highest significant parameter effect on food security at $Beta = .22$; collective action, represented by the block titled village participation, has a statistically significant influence on food security at $Beta = .17$; the presence of additional incomes has a significant influence on food security at $Beta = .18$; finally, empowerment also has a significant influence on food security at $Beta = .16$. Social capital was found to have a negative significant influence on empowerment at $Beta = -.20$. Our model also looked at the mediated effect of social capital, empowerment, and collective action on the dependent variable. In this case, no regression coefficient has a significant influence on a respondent's access to additional income.

The path model indicates that each of the three latent effects of MFOs, based on the literature on positive influences of MFOs, does significantly influence a women's food security. Simply stated, the higher a women's level of social capital, perceived self-empowerment, and the level of collective action in her village, the more food secure she and her family are. These predictors do not significantly predict whether or not women will have access to additional income.

Discussion

H0: Food security is statistically influenced by the three latent effects of MFOs

Our path model indicates that the variables social capital, empowerment, and collective action do positively influence participants' food security. The relatively low variance of the standardized

coefficients to one another suggests that they each have a similar measurable impact on food security, i.e. one predictor does not drastically improve food security compared to others. This finding is congruent with the literature on MFOs, and it indicates part of the reason MFOs are so successful; in that, they have been found to have an impact on factors that create food security in rural developing regions.

H0.: Food security is statistically influenced by access to additional income.

In addition, testing the three latent residual effects of MFOs on food security, our model also tests the statistical impact that access to additional income has on food security. The model suggests that women who have access to additional income will have greater food security. Intuitively this makes sense; women who have fallback income or secondary incomes of any sort, would likely have the necessary means to purchase food for themselves and their families.

H0.: Access to additional income (manifest effect) is statically influenced by the latent effects of MFOs.

Lastly, our model tested the influence that social capital, empowerment, and collective action had on a women's access to additional sets of income. No variable that predicts food security also predicts additional income at a statistically significant level. That is to say that, our model, based on literature support of previous MFO studies, does predict food security fairly well. However, our same model of MFO residuals on food security does not predict access to additional income at all.

Our findings provide evidence that suggest MFOs are, in part, successful in promoting food security because they have key components that promote social capital, women's empowerment, and participation in collective action. In addition, and perhaps the most prominent aspect of MFOs, is their focus on creating viable income-generating small businesses. Again, our model suggests that this, too, is influential in promoting food security for women and their families in rural Uganda. However, additional income is only one indicator of food security, and it happens that our model does not support additional income; the model predicts food security but not whether or not a woman has additional income. This suggests that although a fully functioning small business may not result from participation in MFOs, it is likely that other skills gained from participation, simultaneously, are likely to result in the same desired effect – being more food secure. It is important to note that these findings are not generalizable to whether or not a participant in a MFO is successful or not in starting a small business or the influence that small business creation has on food security. Rather, these findings indicate that the training process implored by many MFO's helps create several key factors that have been shown to help create food security.

Limitations

There are two primary limitations of this study: sample size and data collection methodology. We will first discuss sample size and then the methods, which were used to obtain the data. Sample size in this study is low when compared to some other MFO studies (cite). In addition our sample was not a scientifically conducted probability sample; it collected in a

manner that was convenient for field researchers and determined to be least socially invasive to the community, based on recommendations by community leaders and members in an open forum prior to program initiation. Thus, it is not wise to make wide-ranging assumptions from this study. However, we feel that this sample was appropriate due to the uniqueness of the quasi-experimental design. Our sample participants are women that were chosen to actively participate in an MFO, and these data represent a reference group from which longitudinal studies will be based on. Consequently, allowing researchers a better understanding of how the *Vessels International* MFO model influences participants.

The second limitation of this study is the use of on-the-ground translators. Our survey instrument was adapted from scholarly work on surveying instruments specific to international research (*see* Grootaert 2004; Grootaert & Van Bastelaer, 2002) to address the needs of this baseline study. Trained international development researchers with significant experience specific to East and Sub-Saharan Africa, and moderate local language skills administered our survey instrument with necessary translations provided by local affiliates of *Vessels International*. The language barrier undoubtedly introduced some degree of measurement error and perhaps measurement biases to the study. However, in order to reach to those women who were deemed to be in most need of MFO participation, on-the-ground accommodations had to be made to include a diversity of native language and dialects. In order to keep a reasonable sample size, an EM imputation method was employed to deal with any missing data values. Although this technique is considered appropriate in SEM studies, it is not without its drawbacks; Enders (2001) states, “Although the imputed values are optimal statistical estimates of the missing observations, they lack the residual variability present in the hypothetically

complete data set; the imputed values fall directly on a regression line and are thus imputed without a random error component.” (p. 137)

Policy Recommendation

The results of this study indicate that the reason that MFOs have been so successful in the last several decades is, in part, due to their inclusion of components that improve women’s access to food security. The literature shows that although creating a viable income through the creation of small businesses is the primary function of many MFOs, their latent effects are just as powerful, as indicators of food security. Our hypothesized model theorizes that the latent effects of MFOs would not only improve access to food security but also access to additional income in women who have not yet started participating in a MFO. The tested model did not find any evidence to support this hypothesis. In terms of policy recommendation and MFO evaluation—which has proved to be difficult, due to the extreme poverty conditions within which participants exist – equal time and effort should be mobilized to ensure that participants receive adequate training in self-empowerment, social capital, and collective action-producing activities. Again, it appears that women who might fail as small-time business owners may, in fact, benefit from MFOs just as much—or possibly even more—than women who attained great success in creating a small business, and generating additional and/or supplemental income.

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